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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,874	02/08/2006	Shigeru Nishio	64852(70904)	2387

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EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
GARCIA JR, RENE	

ART UNIT	PAPER NUMBER
2853	

MAIL DATE	DELIVERY MODE
08/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,874	NISHIO ET AL.	
	Examiner	Art Unit	
	RENE GARCIA JR	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/27/06; 02/08/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 02/08/06 and 06/27/06 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Kelly (US 6,474,573).

Kelly discloses the following claimed limitations:

*regarding claims 1 & 3, electrostatic suction type fluid discharge device**/electrostatic atomizer/** (ABS) which discharges by electrostatic suction a discharge fluid, which is electrically charged by voltage application, onto a substrate through a fluid discharge hole of a nozzle of a fluid discharge head, so as to form a drawing pattern on a surface of the substrate, the fluid discharge hole, provided in the nozzle**/orifice, 26/** (col. 5, lines 4-12), having a diameter ranging from 0.01 μm to 25 μm

(col. 6, lines 1-5; 8-15; 50 μm or less) the electrostatic suction type fluid discharge device comprising: (fig. 1, 2, 3; col. 2, lines 38-42; 54-64; col. 3, lines 9-28; col. 3, line 64 – col. 4, line 16; col. 4, lines 19-26)

*electrode section/**emitter, 44 & counter electrode, 50/** for carrying out application of a driving voltage, causing an electric charge to be supplied to the discharge fluid, so as to charge the discharge fluid (col. 5, lines 39-48; 56-67), the electrode section being formed by coating an external wall of the nozzle with a conductive material (col. 6, lines 48-64; col. 7, lines 8-30)

*regarding claim 2, electrode section constitutes at least a part of inner wall of the nozzle (col. 5, lines 58-67 – coating aligned with orifice/26/)

*regarding claim 3, nozzle having a tip made of a conductive material, the tip serving as an electrode section for applying a drive voltage to electrically charge the discharge fluid (tip is the coated portion consisting of the counter electrode/50/)

*regarding claim 4, pressure applying means for applying a pressure into the nozzle (col. 6, lines 49-58)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 5 & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly (US 6,474,573) in view of Schantz et al. (US 5,442,384).

Kelly discloses the following claimed limitations:

*regarding claims 5 & 6, electrostatic suction type fluid discharge device**/electrostatic atomizer/** (ABS) which discharges by electrostatic suction a discharge fluid, which is electrically charged by voltage application, onto a substrate through a fluid discharge hole of a nozzle of a fluid discharge head, so as to form a drawing pattern on a surface of the substrate, the fluid discharge hole, provided in the nozzle**/orifice, 26/** (col. 5, lines 4-12), having a diameter ranging from 0.01 μm to 25 μm (col. 6, lines 1-5; 8-15; 50 μm or less) the electrostatic suction type fluid discharge device comprising: (fig. 1, 2, 3; col. 2, lines 38-42; 54-64; col. 3, lines 9-28; col. 3, line 64 – col. 4, line 16; col. 4, lines 19-26)

*electrode section **/emitter, 44/** provided inside the nozzle, the electrode section for carrying out application of a driving voltage, causing an electric charge to be supplied to the discharge fluid, so as to charge the discharge fluid (col. 5, lines 39-48; 56-67)

Kelly does not disclose the following claimed limitations:

*regarding claims 5, inner wall of a tip of the nozzle has a taper section with a taper angle Θ of 21° or greater, provided that L/d>5, where L is a taper length and d is a nozzle diameter

*regarding claim 6, inner wall of a tip of the nozzle having a taper section with a taper angle Θ satisfying a condition: Θ > 58 x d/L, where L is a taper length and d is a nozzle diameter, provided that L/d<100

Schantz et al. teaches the following:

*regarding claims 5, inner wall of a tip of the nozzle has a taper section with a taper angle Θ of 21° or greater, provided that L/d>5, where L is a taper length and d is a nozzle diameter (fig. 8-10; col. 9, lines 28-55 – teaches range of 5 to 15 degrees) for the purpose of increasing discharge speed and provide more focused ejection of fluid

*regarding claim 6, inner wall of a tip of the nozzle having a taper section with a taper angle Θ satisfying a condition: Θ > 58 x d/L, where L is a taper length and d is a nozzle diameter, provided that L/d<100 (fig. 8-10; col. 9, lines 28-55 – teaches range of 5 to 15 degrees) for the purpose of increasing discharge speed and provide more focused ejection of fluid

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a taper angle of 21º or greater; taper angle greater than 58 x d/L , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. **In re Aller, 105 USPQ 233 (C.C.P.A. 1955)**. Further the cited art are related to inventions to expel liquid from an orifice of small diameters and it is known in the art of inkjet printer technology to utilize electrostatic [suction] means to expel such liquid/ink/.

Allowable Subject Matter

7. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The primary reason for indicating allowable subject matter of claim 7 is the inclusion of the limitation of a electrostatic suction type fluid discharge device including electrode section is formed as a bar inserted into the nozzle and a *tip of the electrode section is in contact with the inner wall of the taper section*. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al. (US 7,264,337) teaches an ink ejecting method using an electric field, formed via electrode plates. The electrode plates can either be a single or smaller portions used to direct ink droplets toward a substrate.

Communication with the USPTO

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RENE GARCIA JR whose telephone number is (571)272-5980. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. G./
Examiner, Art Unit 2853

/STEPHEN D. MEIER/
Supervisory Patent Examiner, Art Unit 2853